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LARGE SPECIES OF *TEREBRA*
(MOLLUSCA) FROM THE EASTERN PACIFIC

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INTRODUCTION

The genus *Terebra*, in a broad sense, occurs world wide, usually at comparatively shallow depths, mostly in inshore waters chiefly in tropical and to a lesser extent in warm temperate seas. They live just below the surface on sandy bottoms in generally shallow marine water. There are at least 200 and probably more Recent species. Only six species have been described from strata of Tertiary age in California, but the genus is now represented in west American waters by about 45 species and subspecies. This number, however, is only approximate; the true number depends upon the final disposition of the many names which have been proposed by various authors. Almost all of these species live in tropical and subtropical waters; only two forms range as far north as Santa Monica, California, one of which has been reported (rare) at Santa Barbara, California, in 34° 20' 21" North Latitude.

The largest specimen of *Terebra* in the Henry Hemphill collection in the California Academy of Sciences belongs to the Indo-Pacific *T. maculosa* Linnaeus. It is 201.5 mm. long (the apex lacking). The largest specimen from

west American waters in the collection is *T. strigata* which is 130 mm. long (the apex lacking).

The present paper deals only with five species of *Terebra*, in the strict sense; all except one find their northern range in the Gulf of California region. One of these is reported as far north as Magdalena Bay on the west coast of Lower California and one ranges as far south as Paita, Peru. Three of these have been reported as fossils in beds of Pleistocene age and one of these from strata of Pliocene age. The shells of these mollusks are rather thick, porcelaneous, the subsutural collar is not beaded or nodulous in the adult stage and they are colored with reddish-brown spots or stripes.

This group has at least one relative living in Caribbean waters but a number of allied species inhabit Indo-Pacific areas. The West American *T. strigata* bears a resemblance to the Indo-Pacific *T. maculata* Linnaeus and *T. robusta* to *T. subulata* Linnaeus.

Specimens of *Terebra* from various sources included in the collections of the California Academy of Sciences have been available for study during the preparation of this paper. Included among these are specimens in the Andrew Sorensen collection recently presented to the Academy. In addition we have had available specimens of *Terebra* in the collection at Stanford University, through the courtesy of Dr. A. Myra Keen, and those in the San Diego Society of Natural History, through the courtesy of Mr. Emery P. Chace.

Acknowledgment is here made to Mr. Allyn G. Smith and the late A. M. Strong, for advice and aid during the course of work on the present paper.

Family TEREBRIDAE H. and A. Adams

Genus *Terebra* Bruguière

- Terebra* BRUGUIÈRE, Encyclop. Méthod., Vers, vol. 1, p. XV, 1789. [No species cited.] LAMARCK, Mém. Soc. Hist. Nat. Paris, 1799, p. 71. Sole species cited, *Buccinum subulatum* Linnaeus. DALL, Bull. Mus. Comp. Zool., vol. 43, no. 6, p. 245, 1908. "Type *Buccinum subulatum* Linné." WOODRING, Carnegie Inst. Washington, Publ. 385, p. 135, 1928. Type (by monotypy): *Buccinum subulatum* Linné, cited by Lamarck.
- Terebrarius* DUMÉRIEUX, Zool. Analytique, p. 166, 1806. [No species cited.] Edition by Froriep, 1806, p. 167. Species cited, *Buccinum maculatum* Linnaeus. [See Iredale, T., Proc. Malacol. Soc. London, vol. 12, p. 83, 1916.]
- Terebrum* MONTFORT, Conch. Syst., vol. 2, p. 430, 1810. "Espèce servant de type au genre. Vis. tigre. *Terebrum tigreum*" [in the synonymy of which was cited, "*Buccinum subulatum*, Linn. et Gmel. sp. 131"].
- Terebraria* RAFINESQUE, Analyse de la Nature, p. 145, 1815. [Emendation of *Terebra* Bruguière.]
- Subula* SCHUMACHER, Essai Nouv. Syst. Hab. Vers Test., p. 233, 1817. Species cited: "*Subula maculata*" "*Buccinum maculatum* Lin." and "*Subula dimidiata*" "*Buccinum dimidiatum* Lin." HERRMANNSEN, Indic. Gen. Malacozoor., vol. 2, p. 522, 1847. "Typus: *Terebra maculata* L."

TYPE SPECIES. By subsequent monotypy by Lamarck and by subsequent designation Dall, 1908: *Buccinum subulatum* Linnaeus [Syst. Nat., ed. 12, p. 1205, 1767. "Habitat in Indiis." Ref. to "Rumph. mus. t. 30. f.B" and "Gault. test. 56, f. B," also others. Illustrated by Reeve, Conch. Icon., vol. 12, *Terebra*, sp. 22, pl. 6, fig. 22, 1860. "Hab. Society and Philippine Islands (in sand, on coral reefs, at low water); Cuming." See also, Dautzenberg, Mém. Mus. Roy. D'Hist. Nat. de Belge, Hors Sér., vol. 2, fasc. 17, p. 8, pl. 1, fig. 2, 1935. Various localities in Indo-Pacific region. See discussion of this species by Dodge, Bull. Amer. Mus. Nat. Hist., vol. 111, art. 3, pp. 219-221, 1956].

KEY TO THE SPECIES OF *TEREBRA*

- A. A subsutural spiral groove present on all whorls
 a. Color markings a series of conspicuous stripes;
 apical angle 18°. *T. strigata*
 aa. Color markings of four spiral rows of square spots
 on body whorl; apical angle 15°. *T. ornata*
- B. A subsutural spiral groove present only on whorls
 on posterior half of shell
 a. Apical angle 18° to 21°; later whorls tumid. *T. dumbauldi*
 aa. Apical angle 8° to 12°; later whorls slender
 b. Apical angle acute, 8°. *T. lingualis*
 bb. Apical angle broader, 12°. *T. robusta*

Terebra lingualis Hinds.

(Plate 6, figures 4, 5, 6.)

Terebra lingualis HINDS, Proc. Zool. Soc. London for 1843, p. 153, issued June, 1844. "Gulf of Papagayo, Bay of Montejo, west coast of America; ten to seventeen fathoms, sandy mud." HINDS, Zool. Voy. *Sulphur*, Moll., pt. 2, p. 33, October, 1844. [Same locality as in original reference.] HINDS, Thes. Conch., vol. 1, p. 167 (bis), pl. 43, fig. 50, 1845. [Hinds' localities cited.] DESHAYES, Proc. Zool. Soc. London for 1859, p. 308, issued between July and October, 1859. "Golfe de Papagayo; Baie de Montijo". REEVE, Conch. Icon., vol. 12, *Terebra*, sp. 15, pl. 5, fig. 15, 1860. [Hinds' locality records cited.] MÖRCH, Malakozool. Blätter, Bd. 7, p. 105, 1860. "Realejo." [Nicaragua.] TRYON, Man. Conch., ser. 1, vol. 7, p. 11 (in text), pl. 2, fig. 17, 1885. (Copy of Reeve's pl. 5, fig. 15.) M. SMITH, Panam. Mar. Shells (Trop. Photogr. Lab.: Winter Park, Florida), p. 35 (as *Terebra lingualis*), fig. 463, 1944. Cape San Lucas, Lower California, to Ecuador. TOMLIN, Min. Conch. Club South. California, no. 41, p. 14, November, 1944. "Gulf of Papagayo & Gulf of Montejo. Types B. M. (3)." HERTLEIN and STRONG, Bull. Amer. Mus. Nat. Hist., vol. 107, art. 2, p. 213, 1955. "Piñas Bay" and "Guayabo Chiquito," Panama; "Ardita Bay," Colombia. Range: Mazatlan, Mexico, to northern Ecuador.

Terebra formosa DESHAYES, Journ. de Conchyl., vol. 6 (ser. 2, vol. 2), p. 65, pl. 3, fig. 6, July, 1857. "Hab. la mer de Panama." REEVE, Conch. Icon., vol. 12, *Terebra*, sp. 49, pl. 12, fig. 49, 1860. "Panama." TOMLIN, Jour. Conch., vol. 22, no. 5, p. 107, 1944. "Panama. Type B. M."

Terebra insignis DESHAYES, Journ. de Conchyl., vol. 6, (ser. 2, vol. 2), p. 70, pl. 3, fig. 2, July, 1857. "Panama." DESHAYES, Proc. Zool. Soc. London for 1859, p. 308, issued between July and October, 1859. "Panama." REEVE, Proc. Zool. Soc. London for 1860, p. 450, issued between August, 1860 and March, 1861. "Variety of *T. lingualis*, Hinds." TOMLIN, Jour. Conch., vol. 22, no. 5, p. 107, 1944. "Panama. Type B.M. = *lingualis* Hinds."

Terebra (Subula) lingualis Hinds, DALL, Bull. Mus. Comp. Zool., vol. 43, no. 6, p. 254, 1908. Panama in 322 fathoms and in 33 fathoms; off Guaymas, in 20 fathoms; near the head of the Gulf of California in 33 fathoms; Cape San Lucas; Puerto Libertad; Real Llejos. Also Hinds' localities cited.

Terebra (Terebra) formosa Deshayes, KEEN, Sea Shells of Tropical West America (Stanford Univ. Press: Stanford, California), p. 488, fig. 945, 1958. (Copy of Reeve's pl. 12, fig. 49.) Panama.

Terebra (Terebra) lingualis Hinds, KEEN, Sea Shells of Tropical West America (Stanford Univ. Press: Stanford, California), p. 488, fig. 946, 1958. Mazatlan, Mexico, to northern Ecuador.

TYPE SPECIMEN. British Museum (Natural History).

TYPE LOCALITY. "Gulf of Papagayo, Bay of Montejo, west coast of America; ten to seventeen fathoms, sandy mud."

RANGE. Near the head of the Gulf of California, to northern Ecuador, in 13 to 110 meters (7 to 60 fathoms). Cited from a depth of 322 fathoms by Dall, 1908, but he stated that the animal probably did not live at that depth. Pliocene of Costa Rica.

ORIGINAL DESCRIPTION. Ter. testâ turrîto-subulatâ, albidâ, flammeis atrofuscis longitudinalibus ornatâ; anfractibus planulatis, duabus lineis impressis divisus, infra suturam tuberculatis; areâ inferiore laevigatâ; anfractu ultimo subrotundato, laevigato, fasciato; apertura quadratâ; columellâ contorta. Axis 30 lin. (Hinds).

REMARKS. Hinds evidently illustrated an immature specimen of *Terebra lingualis* and Reeve gave a better figure of what may be the same one. The latter illustration shows only the early type of sculpture, namely the heavily beaded, double sutural band as in *T. robusta*, with close-set axial ribs below. The two species cannot be separated at this stage if our material is at all representative. The early sculpture fades to a considerable extent or may even disappear with age as it does on *T. robusta*. The apical angle is consistently slightly smaller, 8° rather than 12° in *T. robusta*. Coloration consists of very irregular brown dots or blotches, roughly arranged in axial manner but there is great variation from whorl to whorl and from specimen to specimen.

Terebra formosa Deshayes was described from Panama and it appears that no additional specimens, so identified, have been reported since. The original illustration reveals an acute apical angle and the color pattern on

the body whorl consists of three rows of reddish-brown spots. These shell characters are so similar to those of slightly worn specimens of *T. lingualis* in the collections of the California Academy of Sciences that we refer the species described by Deshayes to *T. lingualis*.

Terebra ornata Gray.

(Plate 6, figure 1.)

Terebra ornata GRAY, Proc. Zool. Soc. London for 1834, p. 62, issued November 25, 1834. [No locality cited.] REEVE, Conch. Systematica, vol. 2, p. 245, pl. 274, fig. 1, 1842. [No locality cited.] HINDS, Proc. Zool. Soc. London for 1843, p. 160, issued June, 1844. "Hab. Gallapagos Islands; five to seven fathoms, coral sand: Cuming. Panama; seven fathoms, mud: H." DESHAYES in Lamarck, Anim. s. Vert. (ed. 2), vol. 10, p. 253, 1844. "Habite la mer de Panama." HINDS, Thes. Conch., vol. 1, p. 152 (bis), pl. 42, fig. 34, 1845. [Same localities as mentioned by Hinds, 1844.] DESHAYES, Proc. Zool. Soc. London for 1859, p. 307, issued between July and October, 1859. "Hab. Galapagos." REEVE, Conch. Icon., vol. 12, *Terebra*, sp. 14, pl. 4, fig. 14, 1860. "Hab. Galapagos Islands (in coral sand, at a depth of from five to seven fathoms); Cuming." TRYON, Man. Conch., ser. 1, vol. 7, p. 12, pl. 2, fig. 28 (copy of Hinds' figure), 1885. "Galapagos Is." WOODRING, Carnegie Inst. Washington, Publ. no. 385, p. 136 (in text), 1928. "Panama." M. SMITH, Panamic Mar. Shells (Trop. Photogr. Lab.: Winter Park, Florida), p. 36, fig. 468, 1944. Panama; Galapagos Islands. Campbell, Veliger, vol. 3, no. 4, p. 112, 1961. Puerto Peñasco, Sonora, Mexico, in 60 to 80 feet.

Not *Buccinum ornatum* MARTYN, Universal Conch., vol. 3, fig., pl. 92, 1786. [Referable to the genus *Terebra*.] CHENU, Bibliothèque Conchyl., vol. 2, p. 25, pl. 33, fig. 1, 1845. "Chine."

Myurella (Myurellina) ornata Gray, BARTSCH, Nautilus, vol. 37, no. 2, p. 63, October, 1923. [This species designated as the type of the subgenus *Myurellina* Bartsch.]

Myurellina ornata Gray, VANATTA, Proc. Acad. Sci. Philadelphia, vol. 76, p. 425 (in text), 1925, issued February 15, 1924. [Synonymy discussed and the use of *Buccinum ornatum* by Martyn, 1786, is pointed out.]

Terebra (Terebra) ornata Gray, KEEN, Sea Shells of Tropical West America (Stanford Univ. Press: Stanford, California), p. 489, fig. 947, 1958. Panama.

TYPE SPECIMEN. Originally in British Museum (Natural History).

TYPE LOCALITY. No locality cited originally. "Gallapagos Islands; five to seven fathoms, coral sand: Cuming. Panama; seven fathoms, mud: H.," cited by Hinds, 1844. Same localities cited by Hinds 1845. "Hab. Galapagos Islands (in coral sand, at a depth of from five to seven fathoms); Cuming," cited by Reeve, 1860.

RANGE. Off Cape Tosco, Santa Margarita Island, west coast of Lower California, Mexico, to Puerto Peñasco, Sonora, Mexico, in the Gulf of California, and south to Panama and the Galapagos Islands, in 9 to 143 meters (5 to 80 fathoms).

ORIGINAL DESCRIPTION. Ter. testâ turritâ, ovato-subulatâ, solidâ; anfractibus planis, sulco spirali posteriore profundo, cingulo convexo subnoduloso; aperturâ ovatâ, labio interiore subincrassato declivi; albâ, seriebus quatuor macularum parvarum brunnearum quadratarum, serierum intermediarum maculis nonnunquam in strigas oblongas confluentibus. Axis 4 unc. (Gray).

REMARKS. This species can be separated from others in this group by the rather broad apical angle, about 15°, by the regular spiral rows of square dark brown spots and by the deep spiral groove setting off a wide subsutural band which extends from the apex to the aperture.

Vanatta discussed the name *Buccinum omatum* Martyn, referable to the genus *Terebra*, a species identical with the one described in 1822 as *Terebra oculata* Lamarck. The work by Martyn was declared not valid for nomenclatorial purposes in opinion 456, published March, 1957, by the International Commission on Zoological Nomenclature. This action leaves the name *Terebra omata* a valid one for the west American shell.

Terebra robusta Hinds.

(Plate 6, figures 3,7,8; plate 7, figure 1.)

Terebra robusta HINDS, Proc. Zool. Soc. London for 1843, p. 149, issued June, 1844. "Hab. West coast of America, between 8° 57' and 21° 32' north latitude; namely at Panama, Gulf of Nicoya, Gulf of Papagayo, and San Blas: in from four to eighteen fathoms, sandy mud." HINDS, Zool. Voy. Sulphur, Moll., pt. 2, p. 32, October, 1844. [Same localities cited as in preceding reference.] HINDS, Thes. Conch., vol. 1, p. 152 (bis), pl. 42, fig. 35, 1845. [Same localities as cited earlier.] DESHAYES, Proc. Zool. Soc. London for 1859, p. 307, 1859. "Panama; Golfe de Nicoya; Golfe de Papayo; San Blas." REEVE, Conch. Icon., vol. 12, *Terebra*, sp. 10, pl. 3, fig. 10, 1860. [Same localities as originally cited.] MÖRCH, Malakozool. Blätter, Bd. 7, p. 105, 1860. "Realejo." [Nicaragua.] TRYON, Man. Conch., vol. 7, p. 11, pl. 2, fig. 16 (after Hinds), 1885. "W. Coast of Central America." M. SMITH, Panamic Mar. Shells (Trop. Photogr. Lab.: Winter Park, Florida), p. 36, fig. 471, 1944. Gulf of California to Panama. HERTLEIN and STRONG, Bull. Amer. Mus. Nat. Hist., vol. 107, art. 2, p. 214, 1955. "Off Cape Pasado, Ecuador," also other localities in that region. "Range: Guaymas in the Gulf of California to the Rio Esmeraldas, Ecuador. Galapagos Islands."

Not *Terebra robusta* Hinds, GABB, 1873, renamed *Terebra gabbi* DALL, 1896. A species from strata of Miocene age in the Caribbean.

Terebra laroisii GUÉRIN-MÉNEVILLE, Mag. de Zool., 1854, p. 218, pl. 4, fig. 5, 1854. See Reeve, Conch. Icon., vol. 12, *Terebra*, Addenda et Corrigenda, 1860. "*T. robusta*. — Add as synonym *T. Laroisii*, Guérin-Méneville." REEVE, Proc. Zool. Soc. London for 1860, p. 450, "the same as *T. robusta*, Hinds."

Not *Terebra laroisi*, DESHAYES, Proc. Zool. Soc. London for 1859, p. 313. "Hab.....?"

[?] *Terebra pachyzona* MÖRCH, Malakozool. Blätter, Bd. 7, p. 105, August, 1860. "Realejo." [Nicaragua.]

Terebra macrospira LI, Bull. Geol. Soc. China, vol. 9, no. 3, p. 273, pl. 8, fig. 66, 1930. "'Brought up by marine dredge from depths varying from 10.ft. to 40.ft. in the mud at the mouth of the Rio Grande near La Boca about one mile from the mainland in Panama Bay.'" PILSBRY, Proc. Acad. Nat. Sci. Philadelphia, vol. 83, p. 434, 1931. "This is a rather small and slender specimen of *T. robusta* Hinds."

Terebra (Terebra) robusta Hinds, GRANT and GALE, Mem. San Diego Soc. Nat. Hist., vol. 1, p. 465, 1931. Earlier records cited. Pleistocene and Recent. KEEN, Sea Shells of Tropical West America (Stanford Univ. Press: Stanford, California), p. 489, fig. 948, 1958. Guaymas, Gulf of California, to Ecuador, and the Galapagos Islands.

TYPE SPECIMEN. Originally in British Museum (Natural History.)

TYPE LOCALITY. "West coast of America, between 8° 57' and 21° 32' north latitude; namely at Panama, Gulf of Nicoya, Gulf of Papagayo, and San Blas: in from four to eighteen fathoms, sandy mud." "Panama" selected as type locality by Hertlein and Strong, 1955.

RANGE. Guaymas, Sonora, Mexico, in the Gulf of California, to the Rio Esmeraldas, Ecuador, and Galapagos Islands, in 7 to 33 meters (4 to 18 fathoms). Also Pliocene to Recent.

ORIGINAL DESCRIPTION. Ter. testâ turrîto-subulatâ, solidâ, ponderosâ, albidâ, flammeis longitudinalibus interruptè pictâ; anfractibus inferioribus rotundatis, indivisis, laevigatis, superioribus versùs extremitatem spirae subplanulatis, unocinguliferis, longitrorsum plicatis; anfractu ultimo rotundato triseriatim picto, ad basin coarctato; aperturâ elongatâ; columellâ arcuatâ, subcallosâ; epidermide luteo-fuscâ; operculo parvo, crasso. Axis 57 lin. (Hinds).

REMARKS. *Terebra robusta*, a supposedly common species, is represented by fewer specimens than *T. lingualis* in the collections studied by us. It has a slightly greater apical angle, about 12°, than does *T. lingualis* but otherwise the two species are difficult to separate.

The early whorls are highly sculptured with two spiral rows of close-set beads below the suture forming the subsutural band. The remainder of these early whorls has close-set retractorily curved or straight axial ribs. This sculpture fades out with increasing age and the whorls become smooth with only growth lines, very fine spiral lines and no subsutural band present.

Coloration is very variable and even on the same individual there is no constancy from whorl to whorl but the flame-like reddish-brown axial stripes are normally present on some part of the shell. Immature shells with only the early sculpture cannot be separated from *T. lingualis*.

The original figures of *Terebra robusta* and *T. lingualis* of Hinds show shells with the upper spots on the body whorls coalesced into stripes. This seems to be a rare condition because in the rather large series available for this study only two shells from Panama check with these markings, one of

PLATE 6

Fig. 1. *Terebra ornata* Gray. Hypotype, no. 12321 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from locality 17724 (CAS), Cerralbo Channel, Gulf of California, dredged in 84 meters (46 fathoms); Beebe-Crocker Exped., 1936. Length, 75.8 mm., diameter of body whorl, 18.5 mm. P. 71.

Fig. 2. *Terebra dumbauldi* Hanna and Hertlein, new species. Paratype, no. 12322 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from locality 33149 (CAS), Panama; C.H. Dumbauld collector, 1950. Length, 89.1 mm., diameter of body whorl, 22.4 mm. P. 77.

Fig. 3. *Terebra robusta* Hinds. Hypotype, no. 12323 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from the same locality as the specimen shown in fig. 2. Length, 83.8 mm., diameter of body whorl, 17.9 mm. P. 72.

Fig. 4. *Terebra lingualis* Hinds. Hypotype, no. 12324 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from the same locality as the specimen shown in fig. 2. Length, 60.7 mm., diameter of body whorl, 11.2 mm. P. 69.

Fig. 5. *Terebra lingualis* Hinds. Hypotype, no. 12325 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from locality 17843 (CAS), Port Guatulco, Oaxaca, Mexico, dredged in 42 meters (23 fathoms); Beebe-Crocker Exped., 1937. Length, 60.7 mm., diameter of body whorl 11.2 mm. P. 69.

Fig. 6. *Terebra lingualis* Hinds. Hypotype, no. 12326 (CAS), from the same locality as the specimen shown in fig. 2. Length, 65.2 mm., diameter of body whorl, 11.5 mm. P. 69.

Fig. 7. *Terebra robusta* Hinds. Hypotype, no. 12327 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from locality 31699 (CAS), outside Miramar Lagoon, Guaymas, Sonora, Mexico; Andrew Sorensen coll., 1942. Length, 86.5 mm., diameter of body whorl, 18.4 mm. P. 72.

— Fig. 8. *Terebra robusta* Hinds. Hypotype, no. 12328 (CAS), from the same locality as the specimen shown in fig. 2. Length, 85.4 mm., diameter of body whorl, 15.3 mm. P. 72.



which is illustrated on plate 7, figure 1. All of the others have the body markings broken into spots. The only reasonably constant character we can find for separating the two species is in the apical angle. This is not well brought out in the original descriptions or figures but in general *T. lingualis* is narrower. Upon checking the dimensions given in the original description of *T. pachyzona* Mörch (72 mm. × 15 mm., an unfigured species) the apical angle was near 12°. Therefore it seems that it should fall within the variation of *T. robusta*.

Reeve (Conch. Icon., vol. 12, *Terebra*, species 13b, 1860) illustrated a specimen said to have come from Panama. However, a decided subsutural spiral groove persisting from the apex to the aperture is shown on the figure. Such a groove is totally lacking on the later whorls of any specimen of typical *T. robusta* which we have seen.

In a remarkable series of *Terebra* from Panama which was collected by Captain C. H. Dumbauld, the apical angle on three of the figured specimens (plate 7, figures 2, 3, 4) varies from 17° to 21° and in some cases the sides of the spire are concave. It is possible that in a very large series this lot from Panama, together with *T. robusta* and *T. lingualis*, might merge into a single variable species. However, in the available series, the very large and wide shells from Panama appear to be sufficiently distinct to justify the proposal of a separate name for this form.

Terebra strigata Sowerby.

(Plate 7, figures 6, 7.)

Terebra strigata SOWERBY, Cat. Shells in Coll. Tankerville, app. p. XXIII, 1825. "Panama." REEVE, Conch. Systematica, vol. 2, p. 245, pl. 274, fig. 3, 1842. [No locality cited.] HINDS, Proc. Zool. Soc. London for 1843, p. 160, issued June, 1844. "Hab. Panama, very abundant: H." DESHAYES in Lamarck, Anim. s. Vert. (ed. 2), vol. 10, p. 252, 1844. "Habite Panama." HINDS, Thes. Conch., vol. 1, p. 151 (bis), pl. 41, fig. 10, 1845. "West coast of America between Panama and Realejo." DESHAYES, Proc. Zool. Soc. London for 1859, p. 280, issued between July and October, 1859. "Hab. Panama, Realejo." REEVE, Conch. Icon., vol. 12, *Terebra*, sp. 5, pl. 2, fig. 5, 1860. "Panama, Galapagos." [Not the records "Philippine Islands"; "Moluccas."] TRYON, Man. Conch., Ser. 1, vol. 7, p. 12, pl. 2, fig. 29 [copy of Hinds' (1845) figure], 1885. "Panama, Realejo." M. SMITH, Panamic Mar. Shells (Tropical Photogr. Lab.: Winter Park, Florida), p. 36, fig. 470, 1944. Gulf of California to Payta, Peru; Galapagos Islands.

Buccinum elongatum WOOD, Index Test., Suppl., p. 13, pl. 4, fig. 25, 1828. "India." [This locality erroneous according to Hinds, 1845.]

Terebra flammea Lamarck, LESSON, Illustr. Zool., pl. 48, 1832. "vit sur les côtes de l'isthme de Panama." [Not "Hab. in mare Antillarum? habite le golfe des Antilles."]

Not *Terebra flammea* LAMARCK, 1822.

PLATE 7

Fig. 1. *Terebra robusta* Hinds. Hypotype, no. 12329 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from locality 33149 (CAS), Panama; C. H. Dumbauld collector, 1950. Length (incomplete), 79.3 mm., diameter of body whorl, 18.5 mm. P. 72.

Fig. 2. *Terebra dumbauldi* Hanna and Hertlein, new species. Paratype, no. 12330 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from the same locality as the specimen shown in fig. 1. Length, 94.8 mm., diameter of body whorl, 21.8 mm. P. 77.

Fig. 3. *Terebra dumbauldi* Hanna and Hertlein, new species. Holotype, no. 12333 (Calif. Acad. Sci. Dept. Geol. Type Coll.) from the same locality as the specimen shown in fig. 1. Length, 106.6 mm., diameter of body whorl, 27 mm. P. 77.¹

Fig. 4. *Terebra dumbauldi* Hanna and Hertlein, new species. Paratype, no. 12331 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from the same locality as the specimen shown in fig. 1. Length, 102 mm., diameter of body whorl, 26.4 mm. P. 77.

Fig. 5. *Terebra dumbauldi* Hanna and Hertlein, new species. Paratype, no. 12332 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from the same locality as the specimens shown in fig. 1. Length, 79.6 mm., diameter of body whorl, 19 mm. P. 77.

Fig. 6. *Terebra strigata* Sowerby. Hypotype, no. 12334 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from locality 23502 (CAS), tropical western America; J. Vandenburg collector. Length 102.4 mm., diameter of body whorl, 26.2 mm. P. 75.

Fig. 7. *Terebra strigata* Sowerby. Hypotype, no. 12335 (Calif. Acad. Sci. Dept. Geol. Type Coll.), from locality 1478 (CAS), Magdalena Bay, Lower California; H. Hemphill collector. Length, 117.1 mm., diameter of body whorl, 32.0 mm. P. 75.



